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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant: Duhon et al.
Serial No: 09/871,240
Filed: May 30, 2001
For: EXPANDABLE ELEMENTS

Attorney Docket No: 22.1397
Art Unit: 3672
Examiner:

Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination of above-referenced application filed on May 30, 2001, please amend the application as follows:

In the Specification:

Prior to examination, please amend the specification as follows:

On page 6, replace paragraphs 1 and 2 with:

A sealing element 43 is formed on the outside surface of the superplastic sleeve 14. The sealing element 43, which may be formed of an elastomer, is designed to engage the inner wall of the casing, liner, tubing, or pipe 40 to isolate the wellbore above and below the expandable plug 10.

In operation, to set the expandable plug 10, a survey may be initially performed with a surveying tool (not shown) to determine the temperature and pressure of the wellbore at the desired depth. Once the temperature and pressure has been determined, the surveying tool may

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30 NOVEMBER 2001

Susan J. Stewart

be pulled out of the hole and the expandable plug 10 lowered into the wellbore. When the expandable plug 10 is lowered to a desired depth, some time is allowed for the plug 10 to equalize to the temperature of the wellbore. The setting process is then started by firing the igniter 24, which initiates the propellant stick 28 to create heat and to generate gas in the chamber 30. The increase in pressure in the chamber 30 creates a differential pressure across the power piston 32, whose other side is at atmospheric chamber. Due to the increased heat, the expandable element 12 becomes molten. As a result, the resistance against movement of the power piston 32 is removed so that the gas pressure in the chamber 30 pushes the power piston 32 upwardly. The molten element 12 is displaced and expands to deform the sleeve 14, which due to the increased temperature is now exhibiting superplastic characteristics. As best shown in Fig. 2, the sleeve 14 radially deforms outwardly by force applied by the power piston 32 so that the sealing element 43 is pressed against the inner wall of the casing 40.

In the Drawings:

Attached are two pages of drawings amended in red ink. The changes presented bring the drawings into conformance with the invention as described in the specification. No new matter is presented. Corrected formal drawings will be provided directly to the official draftsman.

In Figure 1, the second reference to 42 has been changed to 43.

In Figure 5, the reference lines have been moved to indicate the appropriate structures as recited in the detailed description of the invention.

In Figure 6, reference number 210 has been changed to 212 to conform with the description of the invention.


REMARKS/ARGUMENTS

The specification and drawings have been amended to correct typographical errors in the numbering of the elements of the invention as originally filed with the application. No other changes have been made. No new matter has been added

Attached hereto is a marked up version of the changes made to the specification by the current amendment. The attachment is captioned **"Version with Markings to Show Changes Made."**

Applicant respectfully requests entry of these amendments prior to the commencement of examination in this case. No fees are believed to be necessary for entry of this amendment. If it is determined that fees are necessary, please charge them to Deposit Account No. 50-0457.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

A sealing element [42] 43 is formed on the outside surface of the superplastic sleeve 14. The sealing element [42] 43, which may be formed of an elastomer, is designed to engage the inner wall of the casing, liner, tubing, or pipe 40 to isolate the wellbore above and below the expandable plug 10.

In operation, to set the expandable plug 10, a survey may be initially performed with a surveying tool (not shown) to determine the temperature and pressure of the wellbore at the desired depth. Once the temperature and pressure has been determined, the surveying tool may be pulled out of the hole and the expandable plug 10 lowered into the wellbore. When the expandable plug 10 is lowered to a desired depth, some time is allowed for the plug 10 to equalize to the temperature of the wellbore. The setting process is then started by firing the igniter 24, which initiates the propellant stick 28 to create heat and to generate gas in the chamber 30. The increase in pressure in the chamber 30 creates a differential pressure across the power piston 32, whose other side is at atmospheric chamber. Due to the increased heat, the expandable element 12 becomes molten. As a result, the resistance against movement of the power piston 32 is removed so that the gas pressure in the chamber 30 pushes the power piston 32 upwardly. The molten element 12 is displaced and expands to deform the sleeve 14, which due to the increased temperature is now exhibiting superplastic characteristics. As best shown in Fig. 2, the sleeve 14 radially deforms outwardly by force applied by the power piston 32 so that the sealing element [42] 43 is pressed against the inner wall of the casing 40.

In the Drawings:

See the attached copy of the drawings marked in red to indicate the changes described above.